

II. Amendments to the Claims

This listing of claims replaces without prejudice all prior versions and listings of claims in the application:

Listing of Claims:

17. (Currently Amended) An injection molding machine comprising:

a plurality of molding devices which perform an injection molding operation;

a system control processor for causing said plurality of molding devices to perform the injection molding operation;

a plurality of hydraulic actuators for respectively moving said plurality of molding devices;

a plurality of valves for respectively providing hydraulic fluid to said hydraulic actuators to move the at least one of said plurality of molding devices;

at least one manifold which provides hydraulic fluid to the plurality of valves; and

a processor, disposed adjacent at least one of (i) said manifold, ~~and~~ (ii) at least one of said plurality of valves, and (iii) at least one of said plurality of hydraulic actuators, and being coupled to one or more of said plurality of valves and to

said system control processor, said processor storing a control program for at least one of said plurality of hydraulic actuators, said processor controlling said one or more of said plurality of valves based on the stored control programs and command signals received from said system control processor.

18. (Currently Amended) The machine according to Claim 17, further comprising a plurality of sensors for sensing a performance characteristic of ~~monitoring~~ said at least one of said plurality of hydraulic actuators and providing a plurality of feedback signals to said processor, and wherein said processor controls the one or more of the plurality of valves using the feedback signals and the control programs.

19. (Currently Amended) The machine according to Claim 18, wherein said processor performs closed-loop control of the at least one of said plurality of hydraulic actuators ~~one or more valve~~ based on the feedback signals and the control programs.

20. (Currently Amended) A method of controlling a hydraulic actuator which is supplied with hydraulic fluid from a controllable valve and a manifold, with a microcontroller that is disposed adjacent at least one of: (i) said manifold; (ii) at least one of said plurality of valves; and (iii) at least one of said

plurality of hydraulic actuators, and is coupled to a system control processor, comprising the steps of:

~~disposing a microcontroller adjacent the manifold;~~

storing in the microcontroller a control program for controlling a movement of the hydraulic actuator;

providing to the microcontroller feedback signals from at least one sensor which senses a performance characteristic associated with the hydraulic actuator;

providing to the microcontroller command signals from ~~the~~ a system control processor;

calculating, in the microcontroller, control signals to control the valve to cause movement of the hydraulic actuator ~~controller~~, said microcontroller being capable of calculating the control signals based on one or more of the feedback signals, the command signals, and the stored control program; and

transmitting the control signals to the controllable valve.

21. (Cancelled)

22. (Previously Presented) The method according to Claim 20, further comprising the steps of:

storing, in the microcontroller, the feedback signals;
and

transmitting the stored feedback signals from the microcontroller to the system control processor.

23. (Previously Presented) The method according to Claim 22, further comprising the step of controlling a plurality of hydraulic actuator valves with said microcontroller.

24. (Currently Amended) The method according to Claim 20, wherein said microcontroller performs closed-loop servo control of the hydraulic actuator ~~controllable~~ valve based on the stored control program and the feedback signals.

25. (Previously Presented) The method according to Claim 20, wherein the microcontroller generates control program data based on the feedback signals.

26. (Previously Presented) The method according to Claim 20, further comprising the step of transmitting control program data to the microcontroller from the system control processor.

27. (Previously Presented) The method according to Claim 20, wherein said microcontroller controls said controllable valve to cause linear or rotary movement of said hydraulic actuator.

28. (Previously Presented) The method according to Claim 20, wherein said microcontroller controls said controllable valve to linearize nonlinear characteristics of said hydraulic actuator.

29. (Previously Presented) The method according to Claim 20, wherein the hydraulic actuator has an additional controllable valve, and wherein said microcontroller controls both controllable valves to provide regenerative and non-regenerative control of said hydraulic actuator.

30. (Cancelled)

31. (Currently Amended) Apparatus for controlling a hydraulic actuator, comprising:

a first valve coupled to the actuator and causing movement of the actuator by controlling movement of hydraulic fluid through said first valve;

a second valve coupled to both said first valve and the actuator and causing movement of the actuator by controlling movement of hydraulic fluid through the said first valve and the second valve; and

a microcontroller, disposed adjacent at least one of the valves, which controls said first valve and said second valve to

provide profiling of one of (i) pressure and (ii) flow into and out of the hydraulic actuator.

Claim 32 (Cancelled)

33. (Previously Presented) The method according to Claim 20, further comprising the step of storing in the microcontroller the performance characteristic curve for the controllable valve.

34. (Previously Presented) The method according to Claim 20, wherein said microcontroller linearizes said feedback signals.

35. (Previously Presented) The method according to Claim 31, wherein said microcontroller controls both controllable valves to provide one of (i) regenerative and (ii) non-regenerative control of said hydraulic actuator.

36. (Previously Presented) The method according to Claim 20, further comprising the step of storing in the microcontroller additional operational parameters.

37. (Previously Presented) The machine according to Claim 17, wherein the processor is disposed within one meter of said manifold.

38. (Previously Presented) The machine according to Claim 17, wherein the processor is disposed within one meter of at least one of said plurality of valves.

39. (Previously Presented) The method according to Claim 20, wherein the microcontroller is disposed within one meter of the manifold.

40. (Previously Presented) The apparatus according to Claim 30, wherein the microcontroller is disposed within one meter of the hydraulic actuator.

41. (Previously Presented) The apparatus according to Claim 31, wherein the microcontroller is disposed within one meter of the first valve.